Section 5. Ambient Air Quality Monitoring Quality System Strategy

5.1 Introduction

Since the implementation of the ambient air monitoring program, there has been little change to the quality assurance (QA) regulations and the resultant quality system for the program. As new monitoring programs were developed (e.g., $PM_{2.5}$), new regulations were added. But little thought was given to a review of the overall system for ensuring the quality of the nations data.

Within the same period of time, changes within monitoring and QA have taken place:

- The National Performance Audit Program saw a reduction in funding which resulted in fewer audits being distributed.
- Monitoring technology has changed making instruments more reliable and stable.
- New QA processes, like data quality objectives, performance based measurement systems, and data quality assessments, have been developed.
- EPA QA policy has been revised in areas like the development of quality management plans and quality assurance project plans.

With the re-thinking of the monitoring process should also come a re-thinking of the processes of ensuring the quality of our data. This section will address a strategy for the review and if necessary redevelopment of a quality system that is germane, flexible where necessary, and responsive to changes in the monitoring program.

5.1.1. The Quality System

An important concern in any organization that is collecting and evaluating environmental data must be the quality of the results. A quality system must be developed and documented to ensure that the monitoring results:

- meet a well-defined need, use, or purpose;
- satisfy customers expectations;
- comply with applicable standards and specifications;
- comply with statutory (and other) requirements; and
- reflect consideration of cost and economics.

A quality system is defined as a structured and documented management system describing the policies, objectives, principles, organizational authority, responsibilities, and implementation plan of an organization for ensuring quality in its work processes, products, and services. The quality system provides the framework for planning, implementing, assessing, and reporting worked performed by the organization and for carrying out required QA and quality control (QC).

The development of a quality system requires a coordinated effort between stakeholders: EPA Headquarters, the EPA Regions, and the SLT monitoring community. As the strategy is presented, roles and responsibilities of the stakeholders will be identified and discussed.

5.2 Quality System Review/Improvement Process

The goal for this QA Strategy is to take a philosophical look at QA with the premise: "what are appropriate quality system elements and activities for an ambient air monitoring program"? Once this is determined, any monitoring program would address the quality system elements/activities in an appropriate manner for their objectives, thereby creating some flexibility in the approach to data quality (i.e., a graded approach to QA).

In maintaining consistency with the Strategy objectives, it was felt that the best way to improve the Ambient Air Monitoring Program quality system was to thoroughly review the current program in light of new quality assurance concepts and policy. This review had supporting goals to:

- develop an understanding and respect of the various stakeholder goals for collecting ambient air monitoring data and the various levels of acceptable data quality;
- provide a structure in which the elements vital to a healthy QA program are intimately tied to the monitoring program (i.e., are funded commensurate with ambient air monitoring);
- provide an integrated (SLT/Region/Headquarters) approach to ambient air quality monitoring quality system development and implementation;
- review and solidify roles and responsibilities;
- move towards the development of performance based measurements and assessments to identify acceptable data quality;
- eliminate redundancies to improve cost efficiencies;
- establish a graded quality system approach to allow resource prioritization toward measurement systems that are classified as critical;
- provide a thorough review of regulations in order to identify requirements and those elements that could be considered guidance;
- revise regulations (CFR) and guidance (Red Book, Vol. II) to reflect the new recommendations;
- create an atmosphere of stakeholder cooperation and commitment toward implementing the quality system; and
- establish a phased approach toward implementation, with a flexible timeline to assure that each step is thoroughly completed.

In order to accomplish these goals a QA Strategy Workgroup (Workgroup) was developed. The Workgroup is composed of staff members from EPA Headquarters, EPA

Regions, and SLTs. To meet the established goals, the Workgroup developed some fundamental characteristics for QA changes. The QA system should be:

- performance based;
- workable;
- based on common sense;
- based on good science;
- flexible;
- defendable and comparable;
- balanced against legal requirements;
- covering both spectrums of air program expertise; and
- implementable

The Workgroup created a list separating the current QA activities into the three elements: 1) planning, 2) implementation, and 3) assessment/reporting. (See **Table 5-1.)** In order to address each QA activity in a consistent manner, an Ambient Air Monitoring Quality System Activity Information Form was developed, as shown in **Figure 5-1.** This process has provided a record of the evaluation of each QA activity, and has further provided the direction to recommend the changes in both regulation and guidance documentation.

Table 1 QA Element and Activity List

Quality System Elements	**Activities and Questions**
Planning	**Activities** · Data Quality Objectives · Regulation Development · Quality Management Plans · QA Project Plans and SOPs · Guidance Documents -Network Design -Methods -QA Manuals
Implementation	**Activities** < Training < Internal Quality Control Activities -precision checks (automated/manual) -verification/calibration (zero/span checks, flow rate checks etc) - QC described in CFR and guidance (MQO tables in Redbook APP 3) -standards certification -instrument and equipment maintenance < Record keeping < Data verification/validation
Assessment/ Reporting	**Activities** < Site Characterizations < Performance Evaluations (NPAP, PEP, Region/SLT Performance audits) < Management Systems Reviews < Technical Systems Audits < Data Quality Assessments < QA Reports < P&A Reports

Ambient Air Monitoring Quality System Activity Information Form

Quality System Element:_____ (Planning, Implementation, Assessment/Reporting)

Quality System Activity:_____

Activity Description:

Definition
Actions covered under this description
What is the function or use of this activity?
Is the activity important? (what does it get us)
Is there a product? Who is the major user of the product or information
Is this a new activity? What activity does it replace or enhance?
Brief description of current activities
Who is responsible for the activity (currently)

Pros and Cons of the activity as it's currently implemented:

Ways of improving the activity:

Who should be providing (responsible for) this activity?

Are changes to regulation or guidance required?

Figure 5.1. Ambient Air Monitoring Quality System Activity Information Form

The Workgroup process is expected to be completed over a period of several years, likely concluding by 2004. Over 80 QA action items were identified (see **Attachment 5.1**) and prioritized. As recommendations are completed by the Workgroup, they will be provided to the NMSC for review. The NMSC will evaluate these for content and consistency with the overall Strategy objectives. A summary of Workgroup activities to-date are provided in **Attachment 5.2.** The recommendations, which follow in the next subsection, are based primarily on the efforts to-date of the Workgroup.

5.3 Recommended Changes

5.3.1. Performance-Based Measurement Process (PBMS)

A performance-based measurement process should be the primary tool for selection or identification of appropriate methods for ambient air monitoring. PBMS is a set of processes wherein the data quality needs, mandates or limitations of a program or

project are specified and serve as criteria for selecting appropriate methods to meet those needs in a cost-effective manner. PBMS can be achieved by using the data quality objective (DQO) process early in the planning process. DQOs need to be developed in concert with the setting of the attainment standards, since population and measurement uncertainty may dictate where the NAAQS is set and what errors can be tolerated. DQOs would then set the stage for the development of federal reference method acceptance criteria that would be in step with the DQO. As an example, the DQOs developed for $PM_{2.5}$ are now being used to determine the "acceptability" of continuous $PM_{2.5}$ monitors.

OAQPS would be responsible for developing DQOs for federally mandated data collection efforts. DQOs for other data collection activities (i.e., DQOs for non-trends speciation sites) would be the responsibilities of the SLTs. Relative to NCore, since the monitoring for comparison to the NAAQS would be included in NCore, therefore, DQOs would be developed by OAQPS for monitoring to fulfill this objective.

The performance-based approach that lends itself to flexibility will put more responsibility on the SLTs for developing quality systems. Therefore, there will be a greater importance and emphasis on QA project plans. Recommendations for this category include:

1) Completing DQOs for other criteria pollutants - Prioritize this activity to ozone and toxics (if necessary). With a coarse particulate matter standard expected, get ahead of the curve for this DQO. As time allows, utilize the DQO process to establish DQOs for the other criteria pollutants.

2) Linking DQOs more directly to Federal Reference Method and Equivalency Program - It is important to continue implementation of the Federal Reference Method and Equivalency Program, but the acceptance criteria should be linked to the DQOs.

3) Using a graded approach to QA – Under the Strategy, the use of air monitoring data will have multiple applications. Therefore, some monitoring objectives may not call for quality systems and quality assurance documentation (QAPPS) to meet the stringent requirements for NAAQS comparison purposes.

4) Not deploying new network monitors until full testing – A greater level of real-world (e.g., not just laboratory) testing of monitoring equipment needs to occur prior to implementation of new monitoring programs. This will help identify monitor problems and will supply information on population and measurement uncertainties. NCore Level 1 sites (at least one) might be used for testing purposes.

5) Providing more ambient air specific training on the DQO process.

6) Providing a vehicle for statistical support on DQOs - OAQPS would establish a contract vehicle that would allow SLTs to tap into statistical help as it relates to DQOs.

5.3.2 Roles and Responsibilities

For each aspect of the QA process, there needs to be a clear understanding of the roles and responsibilities for each participant (i.e., OAQPS, EPA Regions, and SLTs). In addition, within the SLT organizations, there should be a responsible QA manager, and to the degree it can be accommodated, a group of people who understand the QA system and are further empowered to implement it. The specific definition of the roles and responsibilities is still a work-in-progress.

5.3.3. Funding/Resource Issues

QA activities need to be intimately tied to the monitoring process so that costs for the quality system increase/decrease commensurately with monitoring costs. Resource and funding related action items include:

1) **Providing a reasonable estimate of the "cost of QA"** - Identify quality system elements for a "typical" SLT monitoring organization and provide an estimate of the costs of an adequate quality system. Use these estimates to provide a percentage of monitoring costs that should be allocated to the implementation of a quality system.

2) **Ensuring funds are available for QA training** – EPA provides regular and continuing training on many aspects of air programs. It is important to include QA training as part of the overall training program.

3) **Providing Contractual Support** – There should be a mechanism for OAQPS to allow SLTs to tap into statistical expertise for development of data quality objectives, data quality assessments, and other statistically-related assessments.

4) **Applying State and Territorial Air Grants (STAG) Resources for NPAP** - STAG resources should be used to cover the NPAP program. STAG funds currently pay for the $PM_{2.5}$ Performance Evaluation Program (PEP). The NPAP program is currently being re-invented to a through-the-probe audit process. The added costs to each state to implement this new program is estimate to be about $11,000 per year. More information on this suggestion is included in the performance evaluation subsection.

5.3.4. Regulation Changes

Regulations for the Ambient Air Monitoring Program quality system can be found primarily in 40 CFR part 58, Appendix A and Appendix B. However, quality control criteria can also be found in 40 CFR part 50 that describe the method requirements. Efforts to date have focused primarily on part 58. Therefore, this section

will not contain specific regulation changes to a particular pollutant, but will provide recommendations at a broader scale. Recommendations and action items include:

1) **Reducing confusion between requirements and guidance**- In general anything in regulation identified as a "must," "shall" or "will" is considered mandatory. Guidance documents usually supplement the regulation by providing additional information. Guidance documents may provide additional "suggested" methods, quality control samples, or acceptance criteria that are not found in CFR and are, therefore, not mandatory. However there have been cases where CFR requires that guidance documents be followed. This has added some confusion to the traditional use of regulations and guidance documentation.

2) **Defining a graded approach in CFR**- EPA has endorsed using a graded approach for QA, meaning tailoring your quality system and QA project plan development to the objectives for which the data are being collected. For example, developing a quality system for data that will be used to make regulatory decisions would need a "more stringent" quality system than an air monitoring program for environmental education purposes. It is necessary, then, to define and utilize the graded approach as it relates to the collection of ambient air data for different monitoring objectives. The approach needs to provide balance between monitoring objectives and data comparability among programs with similar objectives.

3) **Combining Part 58 Appendix A and B**- Since most of the requirements for Appendix A (SLAMS) and Appendix B (PSD) are the same, the combining of these appendices will be explored.

4) **Reviewing the requirements, focusing on the "musts"** - If the performance-based measurement systems are to work, performance goals (DQOs) are needed, and quality control (QC) samples could be used to evaluate the achievement of the goals. However, the frequency of implementing the requirements and some of the actual acceptance criteria may not be required in CFR. These specifics would be included in guidance documents. Therefore, organizations with sophisticated QA programs could have the flexibility to develop their quality systems with minimal hindrance in requirements, while organizations that had less sophisticated programs or expertise could use the guidance to develop their quality systems. Allowing this type of flexibility will put much more emphasis on the development, approval, and use of QA project plan documentation and oversight activities.

5) **Revising CFR to provide for quarterly data certifications** - Due to the emphasis on real-time reporting, data quality validation and evaluation is occurring earlier in the monitoring process than in the past. In addition, the QA Reports distributed by OAQPS (i.e., CY99 and CY00 $PM_{2.5}$ QA Reports) have limited usefulness because the data are not evaluated until after it is officially certified, typically 6 months after the calendar year in which it was collected.

Certifications could occur sooner and a proposal for quarterly certifications is being considered.

5.3.5 Training and Guidance

Recommendations and actions items related to training and guidance are as follows:

1) **Place more emphasis on training**- In general, QA training has been neglected, as compared to other air program training activities. Mechanisms for achieving QA training be included in the overall training process for SLTs. Further, by identifying specific training in QAPPs, or as part of technical systems audits recommendations, the training needs are more clearly defined and delineated.

2) **Develop "certification/accreditation" programs** - One way to place more emphasis on training was to establish a national accreditation process to certify personnel in the following categories:

   - Upper Management (basic QA concepts)
   - Ambient Air Monitoring Manager
   - Site Operator
   - Calibrators
   - QA Technician
   - Laboratory Scientist
   - QA Manager
   - Information Manager

   This accreditation process would foster a level of consistency across the nation. SLT organizations need to be creative in how they use and benefit from the accreditation process.

3) **Conduct a poll for guidance-** It is suggested that a poll of SLTs be conducted to determine the total universe of guidance of value. It was suggested that STAPPA/ALAPCO could help develop/implement this poll.

4) **Combine all guidance into one document** – Currently, QA guidance is scattered among several documents. There should be one document that could combine all the guidance necessary for ambient air monitoring and associated quality assurance. It is suggested that the QA Handbook Volume II (Redbook) be the home for the various guidance.

5) **Conduct an annual QA Conference** – It is recommended that a QA meeting be held annually, similar to the AIRS training. Such a meeting could coincide with the National QA Conference in order to take advantage of the training modules put on by EPA Quality Staff at the National Meeting.

6) **Develop web-based training programs** - OAQPS should pursue the use of web-based training courses.

7) **Develop a generic QAPP** - Take the G-5 EPA QAPP guidance and develop a generic ambient air monitoring QAPP software product that would allow the SLTs to input the correct information into each section for their particular monitoring program.

5.3.6. Data Certification and Quicker Data Access on AIRS

Due to the more recent emphasis on real-time reporting of data, the real-time review/verification/validation of data has become equally important. Because of more timely data assimilation, the current process of certifying a calendar year's worth of data six months after the end of the previous calendar year can be improved. A majority of data verification/validation efforts have already been automated in many state and local agencies. Delays in getting data into AIRS in many cases is simply because the regulations allow it. The QA Report would have more value if it was reported sooner, and accordingly would require earlier certification of data. A number of recommendations on this topic include:

1) **Providing more automated requirements for data review/verification/ validation** – It is recommended that an initial capital expenditure of information capture and transfer technologies (e.g., data loggers, telemetry, automated quality control) for automatic transfer of routine and quality control information to central facilities be considered. Included in this would be quality control systems for automating various QC checks, like zero/span checks, or bi-weekly precision checks.

2) **Providing for quarterly certifications-** Instead of waiting six months from the end of the calendar year, provide a mechanism for certification on a quarterly basis.

3) **Certified/uncertified data flagging** - Data qualifiers are not used for the majority of the criteria pollutants, meaning that SLT personnel wait for data to be validated before uploading to AIRS. Since many SLTs use data qualifiers on their local sites to inform data users that the real time data is not validated, AIRS data could be initially uploaded as "unqualified" and on a quarterly basis, then after validation, have this qualifier removed. This would allow OAQPS to develop generic data evaluation/validation reports on AIRS that could be used or modified by the AIRS user community, rather than having SLTs develop their own reports.

4) **Developing QA/QC evaluation reports –** Opportunities exist to reduce the burden on data validation personnel through the development and generation of various validation/evaluation program reports.

5.3.7 Quality Management Plans (QMPs) and QA Project Plans (QAPPs)

Two of the major QA documentation requirements for EPA-funded programs are quality management plans (QMPs) and project specific QA project plans (QAPPs). EPA provides some flexibility on how these documents are prepared. For example, small local agencies may be able to combine their QMP and QAPP into one document. However, there are also some discrepancies among the EPA Regions on the detail and approval process of QMPs and QAPPs. Since the objectives for the current SLAMS monitoring is similar in all parts of the country, there should be some consistency in the preparation/ review/approval requirements for QMPs and QAPPs for the ambient air monitoring program.

As mentioned earlier, if the performance-based measurement process is to be successful, the responsibility of creating an adequate quality system will be the responsibility of the SLTs, and not mandated in CFR. The QAPP document, under this quality system, will become more important SLTs, since it will indicate how the organization plans on meeting, with the use of various quality control measures, the performance goals. The Strategy will attempt to foster this paradigm shift.

5.3.8. Quality Control Activities

The majority of the day-to-day QA activities at the SLT monitoring organizations involve implementing or assessing quality control information, whether it be zero/span checks, collocated precision, or running field trip or lab blanks. Each method contains a list of required and suggested quality control samples to judge data acceptability of a phase (sampling) of the measurement system or the total measurement system.

Accordingly, it is recommended that the performance-based measurement system principal be used to develop the necessary quality control samples in the regulations without mandating frequency and acceptance criteria. The CFR should identify the types of QC samples that will provide assessments of attaining the DQOs. As can be shown with the $PM_{2.5}$ DQO software tool, various combinations of uncertainty (i.e., precision, bias etc.) affect the attainment of the data quality objectives. The CFR would be revised to identify the uncertainties that needed to be measured as well as the confidence one wanted in the estimate of those uncertainties. The SLTs would then be responsible for developing a quality system that would measure, assess, and control these uncertainties. Therefore, the SLTs would determine how frequently they needed to perform various QC checks and what the appropriate acceptance criteria should be. OAQPS, using the data in AIRS, could also assess data uncertainty to determine if an SLT had developed a quality system that was “in control”. For organizations with less QA resources or experience, guidance documents would continue to be developed that would provide the suggested acceptance criteria and QC sample frequencies.

5.3.9 Site Characterizations

Site characterizations are a type of audit to ensure that samplers or monitors at the monitoring site meet the applicable siting criteria for existing SLAMS, NAMS and PAMS sites, which are now specified in 40 CFR Part 58 Appendix E. The on-site visit consists of the physical measurements and observations such as:

- height above ground level
- proper spacing from various instruments, or
- distance from obstructions and roads.

Recommendations and action items for site characterization that would apply to NCore include:

1) **Setting minimal levels and tracking** - The requirements for the frequency of such characterization would be changed, if necessary. In addition, better tracking of this information would ensure adequate site characterizations are being performed. AIRS has an area that can be used for this tracking activity.

2) **Ensuring updates made in AIRS** - Information from inspections of monitors or sampling equipment added to site, latitude/longitude changes reflect a needed change in the site record in AIRS. This is not always being done. There needs to be some method of ensuring that information found during the site characterization process gets corrected in AIRS in a timely manner.

3) **Developing and using a site characterization form-** A site characterization form and possibly software could be developed and distributed to provide some consistency in performing site characterizations.

4) **Site characterization training-** A training module could be developed for the performance of site characterizations.

5) **Speeding up approvals for discontinued sites-** SLTs submit paperwork for discontinuing sites, but EPA approvals often take a considerable length of time. OAQPS needs to review this process and make it more timely.

5.3.10 Performance Evaluations

Performance evaluations (PE) are a type of audit in which the quantitative data generated in a measurement system are obtained independently and compared with routinely obtained data to evaluate the proficiency of an analyst or laboratory. The types of audits in this category include, for example, the National Performance Audit Program (NPAP), Standard Reference Photometer Program (SRP), PM2.5 Performance Evaluation Program (PEP), as well as any SLT's audit programs. Recommendations for improvement include:

1) **Avoiding redundant programs** - It is known that the goals of the NPAP program are similar to the goals of various SLT programs (e.g., the California Air Resources Board's through-the-probe audit program). In order to avoid performing multiple PEs and reduce QA costs, it is necessary to define an "acceptable" PE program and determine which SLT are performing these. NPAP would not have to include these sites within their PE network other than to establish some level of consistency/equivalency.

2) **Combining NPAP and PEP Program-** NPAP should be revised to a through-the-probe audit approach, and with the possible use of STAG funding, the $PM_{2.5}$ PEP program could be enhanced to include NPAP.

3) **Revising requirements for industry to contribute payments to NPAP-** In the past, the NPAP, which was required under the PSD requirements, provided audits to industry for free. A mechanism for industry payment could be added to these requirements.

4) **Updating guidance and practicability of the SRP.** The SRP guidance has not been revised for a considerable length of time. Due to the stability of new ozone instruments, and the terminology (e.g., definitions of primary and transfer standards, etc.) that needs be revised, it is recommended that the SRP program guidance be updated.

5) **Implementing PAMS audits prior to ozone season**.- The PAMS audits should be scheduled from January to April or within some time frame that information could be evaluated and corrective actions take place prior to each ozone season.

5.3.11 Data Quality Assessments

A data quality assessment (DQA) is a statistical evaluation of a data set to establish the extent to which it meets user-defined application requirements (e.g., DQOs). Historically, DQAs have received little attention in the ambient air monitoring community. With a move towards performance-based measurements systems and DQOs., there will be more emphasis on DQAs. Recommendations include:

1) **OAQPS responsibility for DQAs** – EPA-OAQPS should be responsible for the development of DQAs for all federally required data at the reporting organization level. Assessments at the site-specific level, or for objectives other than federal (i.e., non-trends speciation sites), would be the responsibility of the SLTs and be described in their QAPP.

2) **Developing DQA tools** - Similar to the $PM_{2.5}$ DQO software that is being modified as a DQA tool, as DQO development on the other criteria pollutants move forward, DQA tools will also be made available. It is anticipated that these tools would be integrated with AIRS.

5.3.12. Data Validation/Verification

Similar to data quality assessments, there has not been much emphasis on data verification or validation techniques. Recommendations include:

1) **Utilizing advancements in technology -** Earlier suggestions to increase the use of automated information transfer and quality control systems include the use of various automated data evaluation processes to provide for more real-time consistent screening and data verification/validation activities. Real-time data transfer technology would allow personnel at centralized offices to implement various verification/validation techniques, identify problems, and take corrective actions in a more real-time mode.

2) **Developing and using validation templates -** The continued development of data validation templates, similar to the one developed by the $PM_{2.5}$ Data Validation Template Workgroup, would allow for some level of consistency across the ambient air monitoring program.

3) **Validation programs on AIRS**- The development of data verification/validation techniques on AIRS could be accomplished, but it may have a limited benefit if data do not get reported to AIRS for some considerable period of time.

5.4. Next Steps

The recommendations of the Workgroup are based on a concerted effort to identify, prioritize, and take action on the many aspects of the quality assurance program, so that changes are consistent with the overall Strategy's holistic review of air monitoring networks. To that end, the recommendations presented here should be considered preliminary, in that the Workgroup will be continuing its efforts through 2003. The Workgroup will likely need to enlist other volunteers to chair specific priority projects. Continuing participation by state and local agencies, under the auspices of STAPPA/ALAPCO, will help to assure a timely level of progress.

On a periodic basis, the progress will be reported to the NMSC. Once the final recommendations have been developed and the NMSC has determined consistency with the Strategy, a quality assurance final report will be prepared, and, once endorsed by the NMSC, will be implemented the basis of priorities, time frames, and available resources.

Attachment 1

Ambient Air Monitoring Quality System Activity Form

The following form was used by the QA Strategy Workgroup to identify and review the quality system activities related to the Ambient Air Monitoring Program. The Workgroup created a list separating the current QA activities into the three elements: 1) planning, 2) implementation, and 3) assessment/reporting. Each Workgroup member then selected one "Breakout Workgroup", based on the 3 elements/activities. Each Breakout Workgroup had a mix of Headquarter, EPA Region and SLT personnel. During Breakout Workgroup Conference calls, the Breakout Workgroup discussed the activity and completed the form. This information was reviewed during the Oct 23-25, 2001 QA Strategy Meeting in RTP, NC. The following Element/Activities can be found:

Meeting Date: September 12, 2001

Agenda: Planning Activity I - Data Quality Objectives

Attendees: Dennis Mikel, Mike Papp, Terry Rowles, Alissa Dickerson, Melinda Ronca-Battista, and Rachael Townsend

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Quality System Element: **Planning**

Quality System Activity: **Systematic Planning Process**

Activity Description:

Quality System Activity: DQO Process, including gathering information on costs of different options, assessment of the impacts of options, evaluating their implications in terms of decisions, and writing and revising associated documentation at several iterations of the process.

Definitions: **Data Quality Objectives (DQO) Process** - A systematic strategic planning tool based on the scientific method that identifies and defines the type, quality, and quantity of data needed to satisfy a specified use. DQOs are the qualitative and quantitative outputs from the DQO Process.

Data Quality Objectives (DQOs) — The qualitative and quantitative statements derived from the DQO Process that clarify study's technical and quality objectives, define the appropriate type of data, and specify tolerable levels of potential decision errors that will be used as the basis for establishing the quality and quantity of data needed to support decisions.

When the DQO Process is not applicable (i.e, the objective of the program is estimation, research, or any other objective that does not select between two opposite criteria), a systematic method for defining performance criteria must be used.

Activities covered under this description:

- < This element applies to all data collection activities, although the EPA's graded approach to QA allows simplified DQO processes for small data collection activities. Current DQO guidance does not, however, adequately delineate those cases when a simplified DQO process can be used and what would be acceptable for such a simplified process. The only exception is for training or demonstration projects, where the data will not be used for any purpose. In these cases, the use of the equipment is the point of the exercise.
- < The national program of data collection and analysis for the purpose of comparing to the NAAQS requires a rigorous DQO process for all pollutants for which there is a standard. This effort must come from OAQPS and should be completed as soon as possible.
- < Tribe, State and local agencies should retain the flexibility to develop their own DQOs.

However, DQOs for data used to compare to national standards may continue to be used as de facto allowable bias, precision and LLD values in those cases when data may eventually be used to compare to national standards. Because of this, and for EPA to adhere to its own written policies, it is imperative that OAQPS fund and complete the DQO process for all criteria pollutants.

- < The DQO process may result in performance specifications, rather than equipment specifications. This will increase flexibility and may reduce overall costs.
- < Metadata guidance should be prepared, so that all data incorporated into national or regional estimates from different organizations has associated information such as precision, bias, and LLD.
- < Resources and funding from both EPA OAQPS and EPA Regions should be provided to Tribal, State, and local agencies in the form of training and contract support for these agencies to develop DQOs.

What is the activity's function or use:

- < To ensure that the data are appropriate to be used for the objectives of the data collection effort.

Is there a product? Who is the major user of the product or information:

- < The product is documentation in the form of a QA Plan or manual that includes Data Quality Objectives and other sections that were prepared using EPA guidance. The user is anyone who uses that data for any purpose.

Brief description of current activities:

- < Tribe, State, and local agencies develop DQOs now, usually using guidance from EPA. EPA-funded projects receive different levels of technical review, due to differences among EPA regions and different priorities for different individuals.
- < Tribe, State, and local agencies comply with extremely specific requirements for PM2.5 measurements, while other criteria pollutants, for which no national DQOs were developed, are measured without the same level of consistency in detail.

Who is responsible for the activity (currently):

- < OAQPS is responsible for developing DQOs for Federally required data. Tribes, State, and local agencies are responsible for developing their own DQOs for other data uses.

Is the activity important?(what does it get us):

- < The DQO process, whether simplified or extensive, is mandatory to ensure the data can answer the questions being asked. In addition, knowing the quality of the data allows users to determine if other, un-anticipated questions, can be answered by the data. Without measured

quality in terms of bias, precision, and LLD the data may be easily misused.

Pros and Cons of the activity as it's currently implemented:

Pros:
- Significant flexibility for Tribe, State, and local agencies, except for PM2.5, which is extremely prescriptive.
- Improved compatibility of objectives and measurement methods.

Cons:
- Inconsistency among Tribe, State, and local agencies for small-scale projects.
- Potential misuse of data.

Ways of improving the activity:

< OAQPS needs to develop DQOs for the NAAQS. In addition, there should be a project to evaluate converting the DQOs for PM2.5 to include performance-based standards.
< Complete DQOs for other criteria pollutants. Prioritize this activity to ozone and toxics (if necessary). If a coarse particulate matter standard is coming along, get ahead of the curve for this DQO.
< Link DQOs more directly to Federal Reference Method and Equivalency Program
< Use of a graded approach to QA - Not all ambient air monitoring data are used for comparison to the NAAQS. Therefore some monitoring objectives may not call for quality systems and quality assurance documentation (QAPPS) to meet the stringent requirements for NAAQS comparison purposes
< Provide more ambient air specific training on the DQO process
< Funding should be provided to Tribe, State, and local agencies to develop DQOs
< Provide a vehicle for statistical support on DQOs. OAQPS will establish a contract vehicle that would allow SLTs to tap into statistical help as it relates to DQOs.

Who should be providing (responsible for) this activity?

< All Tribe, State, and local agencies can develop their own DQOs; however, it is incumbent upon a national organization such as OAQPS to develop the national DQOs.
< In order that DQO development be adequately conducted by tribes, states, and locals, the EPA should provide adequate resources. These would include at least Level of Effort contracting for DQO development assistance and training in DQO development specific to air programs.

Does it require changes to regulation or guidance?

Both regulation and guidance should be changed to reflect
1. the DQOs developed by OAQPS for criteria pollutants, and
2. performance-based DQO statement for PM2.5 and other pollutants as an alternative acceptable approach to ensuring adequate data quality.

Meeting Date: September 26, 2001

Agenda: Planning Activity II - Regulation Development

Attendees: Mark Shanis, Terry Rowles, Chris Hall and Rachael Townsend

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Quality System Element: **Planning**

Quality System Activity: **Regulation Development**

Activity Description:

Quality System Activity: Writing, presenting, and revising regulations that specify how the air quality measurements must be made in order to conform to the assumptions made in the DQO process and produce results of the type and quality needed by the decision makers.
Definition:

Portions of 40 CFR 58 Appendix A, which include:

1. General Information
2. Quality System Requirements
3. Reporting
5. Calculations

Activities covered under this description:

< Writing, presenting, and revising regulations that specify how the air quality measurements must be made, analyzed, and reported.

What is the activity's function or use:

< Codify the specifics of quality systems nation wide.

Is there a product? Who is the major user of the product or information:

< Guidance and requirements in 40 CFR that guide quality systems.

Brief description of current activities:

< EPA takes the initiative, review through STAPPA/ALAPCO, proposed for CFR, then promulgated.

Who is responsible for the activity (currently):

< EPA (OAQPS) and designees.

Is the activity important?(what does it get us):

- Important and required.

Pros and Cons of the activity as it's currently implemented:

Pros: - consistency

Cons: - costly and time consuming to implementers

Ways of improving the activity:

- Revision of 40 CFR 58 App. A. and Combine Part 58 Appendix A and B- Since most of the requirements for Appendix A (SLAMS) and Appendix B (PSD) are the same, the Workgroup agreed that the appendices could be combined.
- Address how the regulation process will be affected including the DQO process.
- DQOs are not addressed in the CFR (guidance or required; at what level is it required or appropriate?).
- Review the requirements, focusing on the "musts" - If performance based measurement systems were going to work, performance goals (DQOs) were needed and that quality control (QC) samples would be used to evaluate the achievement of the goals. However, the frequency of implementing the requirements and some of the actual acceptance criteria may not be required in CFR. These specifics would be included in guidance documents. Therefore, organizations with sophisticated QA programs would have the flexibility to develop their quality systems with minimal hindrance in requirements while organizations that had less sophisticated programs or expertise could use the guidance to develop their quality systems.
- Ensure CFR clearly discriminates between requirements and what is guidance; this is made more confusing when guidance documents are referenced in the CFR as a requirement.
- Adjust regulation for guidance on how and when organizations can collapse QMP and QAPP.
- Identify methods to develop the guidance for small organizations and projects, such as those who can collapse the QMP and QAPP.
- The graded approach need to be addressed in the CFR, including specific criteria for different levels of QAPPs with examples.
- Develop a tool to identify each requirement, provide management with use and value information, and access the requirement within the regulation development process to make modifications useful to management during the process. (During processing and development of regulations, include tools for management to understand and ensure communication with technical staff on how it relates to their job. Make sure management have understanding on how to use and importance.)
- Revise CFR to provide for quarterly data certifications

Who should be providing (responsible for) this activity?

- EPA (OAQPS), assisted by affected organizations among Tribes, States, and local agencies.

Meeting Date: September 19, 2001

Agenda: Planning Activity II - Regulation Development (discussion to continue Sept. 26)
(See the attached excerpts from 40 CFR Appendix A with requirements highlighted.)

Planning Activity III - Quality Management Plans

Attendees: Norm Beloin, Mike Papp, Terry Rowles, Alissa Dickerson, Melinda Ronca-Battista, and Rachael Townsend

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Quality System Element: **Planning**

Quality System Activity: **Quality Management Plans**

Activity Description: Defining and requiring content for QMPs.

Definition: **Quality Management Plan (QMP)** — A formal document that describes the quality system in terms of the organization's structure, the functional responsibilities of management and staff, the lines of authority, and the required interfaces for those planning, implementing, and assessing all activities conducted.

Activities covered under this description:

- Defining and requiring content for QMPs.

What is the activity's function or use:

- defines the quality system for the entire organization
- provides a description of the organization and its mission
- describes the organization's management responsibilities
- helps ensure consistency between programs within the organization
- serves as an audit tool

Is there a product? Who is the major user of the product or information:

- QMP guidance published by EPA's Office of Environmental Information, in the form of guidance document EPA QA/R-2 (August 1994); note that this was revised in the spring of 2001 but the changes were very minor (EPA/240/B-01/002). QMPs are developed and revised by most larger monitoring organizations.

Brief description of current activities:

- Revisions to EPA QA/R-2 are not scheduled.
- Revisions to QMPs by Tribal, State, and local organizations.

Who is responsible for the activity (currently):

- EPA's OEI and/or OAQPS, in terms of issuing guidance for QMPs, and the organizations themselves who write and use their own QMPs.

Is the activity important?(what does it get us):

- valuable to organization, particularly States and other large monitoring organizations; see bullets above.

Pros and Cons of the activity as it's currently implemented:

Pros:- see bullets above
Cons:- QMPs are often not distributed to all staff

- no guidance on when the QMP and QAPP can be combined into one document(for smaller organizations)
- no clear guidance on how to ensure independence of QA review in small organizations
- no clear guidance on the use of the graded approach
- no resources are available in many organizations for QMP preparation

Ways of improving the activity:

- Increase consistency between EPA Regional offices on how they review QMPs.
- Revise EPA QA/R-2 with the substantive changes discussed here.
- Define needs for QMPs for all agencies.

Who should be providing (responsible for) this activity?

- EPA's OEI or a separate document from OAQPS with assistance from affected organizations.

Does it require changes to regulation or guidance?

- Yes, changes to EPA QA/R-2 or the issuance of a separate document is required.

Meeting Date: September 26, 2001

Agenda: Planning Activity IV - QAPPs and SOPs

Attendees: Terry Rowles, Melinda Ronca-Battista, Dennis Mikel, Alissa Dickerson, Rachael Townsend

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Quality System Element: **Planning**

Quality System Activity: **QA Project Plans and SOPs**

Activity description: Requiring and specifying content for QAPPs and SOPs.

Activities covered under this description:

Definition: **Quality Assurance Project Plan (QAPP)** — A formal document describing in comprehensive detail the necessary QA, QC, and other technical activities that must be implemented to ensure that the results of the work performed will satisfy the stated performance criteria..
Standard Operating Procedure (SOP)-A written document that details the method for an operation, analysis, or action with throughly prescribed techniques and steps, and that is officially approved as the method for performing certain routine or repetitive tasks.

What is the activity's function or use:

< Guidance for QAPPs is used by Tribe, State, and local agencies to understand and adhere to the EPA requirements.

Is there a product? Who is the major user of the product or information:

< EPA QAPP guidance is used by Tribe, State, and local agencies to develop their required QAPPs, as well as EPA regions in their review of submitted QAPPs. Note that the QAPP guidance document (QA/R-2) was revised in the spring of 2001 but only very minor changes were made (EPA/240/B-01/002).

Brief description of current activities:

< No work is now being conducted by OAQPS or the EPA OEI to prepare or revise guidance for QAPPs.

Who is responsible for the activity (currently):

< OAQPS is the only entity that has the jurisdiction and resources for revising or producing air

monitoring-specific QAPP guidance.

Is the activity important? (what does it get us):

< Revising the QAPP guidance is very important. As it now stands, Tribe, State, and local air departments, especially those in small organizations, are often put in the position of either hiring contractors to produce the statistical evaluation of DQOs or copying DQOs from other groups or projects. Both of these options often produce QAPPs which are not helpful. Revising the current QAPP guidance will bring increased respect for and use of QAPPs and DQOs as sensible, integrated parts of the project. As DQO development becomes a common element of QAPPs, related issues may require changes in QAPP guidance.

Pros and Cons of the activity as it's currently implemented:

Pros: - The model PM2.5 QAPP is thorough and widely used.
S The general QAPP guidance is useful for large-scale projects for large organizations.

Cons: - The QAPP guidance does not include provision for small organizations, or for those projects for which a statistical treatment of DQO options is not relevant.

Ways of improving the activity:

Current guidance for QAPPs and SOPs should be modified as follows:

< Guidance should be provided for those cases when a new statistical derivation of DQOs is not necessary, for example, when a Tribe, State, or local organization is using DQOs already developed by OAQPS for the NAAQS, or when extremely simple conclusions are to be drawn from the results. This guidance should provide clear and simplified treatment of the statistics of DQOs, such as that provided for radiological measurements in the Multi-Agency Radiological Survey and Site Investigation Manual (MARSSIM, downloadable documents at: www.epa.gov/radiation/marssim/). A decision tree to facilitate the choice of options would be useful.
< Develop a generic QAPP - Take the G-5 EPA QAPP Guidance and develop a generic ambient air monitoring QAPP software product that would allow the SLTs to input the correct information into each section for their particular monitoring program
< As part of reference method designation process, make vendors develop adequate SOPs that could be made available for monitoring agencies to modify.
< Guidance to EPA regions on the need for consistency in the review of QAPPs should be issued as soon as possible. Regions now differ widely on their priorities and expectations regarding QAPPs, and this adds confusion and delay to the project approval process.
< Guidance for QAPPs should clearly state that QAPPs that are for projects covered by a QMP do not need to duplicate information in the QMP or applicable SOPs.

Who should be providing (responsible for) this activity?

- OAQPS is the only entity that can initiate this activity.

Does it require changes to regulation or guidance?

- Guidance should be modified or a second QAPP guidance document issued.

Meeting Date: October 4, 2001

Agenda: Planning Activity V - Guidance Documents, such as Network Design and Technical Methods

Attendees: Chris Hall, Dennis Mikel, Mike Papp, Norm Beloin, Alissa Dickerson, and Rachael Townsend

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Quality System Element: **Planning**

Quality System Activity: **Guidance Documents, such as Network Design and Technical Methods**

Activities described: Researching, writing, revising, and obtaining approval for guidance that assists those trying to adhere to the requirements of the regulations. Documents provide non-mandatory information including examples.

Activities covered under this description:

- Writing of new guidance documents, technical methods and network design
- The red books and methods associated with the red books
- Guidance documents on siting criteria

Activities not being done:

- Data quality assessment guidance
- Data validation guidance
- Data acceptance guidance
- Guidance on what level of quality is needed for AQI decisions (real -time-data)

What is the activity's function or use:

- Help define/expand regulations
- Should provide a strongly recommended way of doing the work
- Clarify what is required in the regulation
- Provide some consistency across the nation for monitoring programs

Is there a product? Who is the major user of the product or information:

- Guidance documents and technical documents, including new methods are used by Tribal, State and local agencies as well as data users, like health effects users.

Brief description of current activities:

- < Siting guidance
- < Production of guidance documents
- < Documents are reviewed periodically

Who is responsible for the activity (currently):

- < EPA (OAQPS)

Is the activity important?(what does it get us):

- < Same as function of activity stated above.

Pros and Cons of the activity as it's currently implemented:

Pros: - Pro-active approach to upgrading these documents

Cons: - Have not had enough time to work on; a number of guidance documents are outdated.
- **S** Don't have formal program to review relevance of guidance
- **S** No single way to access all of the guidance documents

Ways of improving the activity:

- < Need more state and local involvement during the early development.
- < State and locals need to have a full time person for QA for the air monitoring programs.
- < Define or clarify attributes or responsibilities of QA person or manager.
- < Get more state and locals in on which documents are more important to them, to prioritize which are more important to them to get revised and updated.
- < QA forum for continued support and exchange of information.
- < Combining all guidance into one document - It was suggested that the QA Handbook Volume II (Redbook) be the home for the various guidance.

Who should be providing (responsible for) this activity?

- < EPA Headquarters

Does it require changes to regulations?

- < No, except for 40 CFR Part 58, App. A, Section 2.2 which states that PAMS must be consistent with EPA guidance.

Meeting Date: September 12, 2001

Agenda: Implementation– Training

Attendees: Tom Parsons, Donovan Rafferty, Jerry Sheehan, Andy Johnson, Rayna Broadway, Anna Kelly, Mark Shanis, Mike Papp

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Quality System Element: **Implementation**

Quality System Activity: **Training**

Activity Description:

Definition: **None**

Actions covered under this description:

- Sampling equipment or measurement device operation, calibration and maintenance
- Laboratory analysis calibration
- Sample chain of custody, preparation, analysis, archiving
- Quality assurance activities - performance evaluation, auditing, data quality assessment
- Information manager

What is the function or use of this activity?

- Ensure that a consistent methodologies are followed that allows for the collection of data of acceptable quality.

Is the activity important?

- Yes- Provides some assurance of data comparability within and between monitoring organization and allows for the transfer of knowledge and experience

Is there a product?

- Yes-More experienced staff and data of acceptable quality

Is this a new activity?

No.

Brief description of current activities

- On the job training - SLT one-on-one or group training

- Regional training (NESCAUM, MARAMA, WESTAR, TAMS)- various training activities put on by regional organization.
- Air and Waste Management Association (AWMA)- training put on a national or specialty conferences
- Vendor training - training put on by vendors which can be incorporated into the purchase of equipment.
- Air Pollution Distant Training Network (APDLN) provide remote televised training which also allow for real-time questions
- Air Pollution Training Institute (APTI)
- Redbook (self instruction)
- The web sites, especially AMTIC

Who is responsible for the activity-

- The responsibility for training occurs at all levels.

Pros and Cons of the activity as it's currently implemented:

Pros - On the job training is probably the most important training technique. Some SLT have good training programs

-APDLN for $PM_{2.5}$ was successful at providing a good general level of training for the program.

Cons - Training is not mandatory so some people do not take training when it would be advantageous

- Funds are not always available remote training if it is needed
- When SLT resources are tight training is one of the first things to be cut
- Although on the job training has advantages, the downside is there's not much standardization in that process and a newer agency or one that has lost its core personnel to attrition can't count on OJT.

Ways of improving the activity:

- Develop web- based training courses
- Place some important training in regulation
- Development of some type of Ambient Air Monitoring Training Certification Program for:

  - Upper Management
  - Ambient Air Monitoring Manager-
  - Site Operator
  - Calibrators
  - QA Manager
  - QA Technician
  - Laboratory Scientist
  - Information Manager

- Tie career growth to training
- Try to include vendor training as part of equipment purchases
- Combining all guidance into one document. Revise the Redbook.
- Annual QA Conference - The workgroup suggested that a QA meeting be held annually (similar to the AIRS Training). It was suggested that this QA meeting coincide with the National QA Conference in order to take advantage of the training modules put on by EPA Quality Staff at the National Meeting.
- Recognize that QA within a state agency may have more than one training need

Does is require changes to regulation or guidance

Regulation:

- Need to decide if certain training should be requirement.
- May include in regulation that training is important and records should be kept of training.

Guidance:

- May want to improve Redbook guidance on training to include certification proposal.

Meeting Date: September 20, 2001

Agenda: Implementation– Data Verification/Validation

Attendees: Tom Parsons, Rachael Townsend, Donovan Rafferty, Rayna Broadway, Anna Kelly, Mike Papp

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Quality System Element: **Implementation**

Quality System Activity: **Data Verification/Validation**

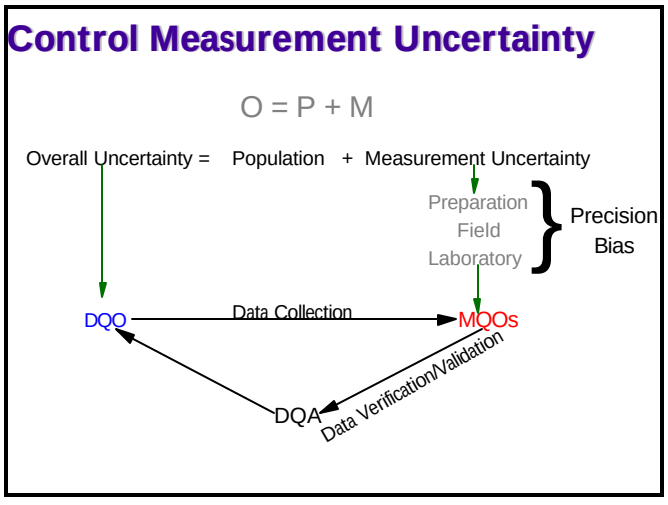
Activity Description:

Definition: **Verification** - Confirmation by examination and provision of objective evidence that specified requirements have been fulfilled. In design and development, validation concerns the process of examining a result of a given activity to determine conformance to the stated requirements for that activity. (ANSI/ISO/ASQC A8402-1994).

Validation- the process of substantiating specified performance criteria. confirmation by examination and provision of objective evidence that the particular requirements for a specific intended use are fulfilled. (ISO 8402)

Actions covered under this description

- Verification of data entry (100% checks, double entry techniques etc.)
- Using QC information to determine the validity of samples.
- Using range checks or internal consistency checks to determine erroneous data.
- Using automated flagging and data quality systems to identify outliers or erroneous data for possible invalidation



What is the function or use of this activity?

The figure can be used to illustrate where validation occurs. DQOs are developed that define the acceptable overall data uncertainty. Measurement quality objectives are developed that help assure that activities occurring at various phases of the measurement process (field, lab etc.) Maintain an acceptable level of data quality. Therefore the MQOs are identified as the various QC samples or QC activities

undertaken to "ensure " the DQOs are met. Data verification/ validation is the process of taking this information to ensure that data of unacceptable quality is identified and appropriately handled so that it cannot effect the decision making process.

Is the activity important? (what does it get us)

- YES

Is there a product? Who is the major user of the product or information

- The "final" product is data of acceptable quality in a final data base. The major user of the QC data are the quality assurance personnel who need this "meta-data" to help determine data validity.

Is this a new activity? What activity does it replace or enhance?

- No, this is not a new activity. It does not replace any activity; it enhances the usefulness of the resultant data.

Brief description of current activities

- In general, the current activity is very similar among most SLTs. Various quality control information is required or suggested to be collected during monitoring activities. These include:

  - zero/span checks
  - weekly/biweekly precision checks
  - Collocated precision
  - equipment stability information (flow, temp pressure)
  - shelter or laboratory information (temp, humidity etc.)
  - Contamination information (field notes, field/trip/lab blanks)
  - performance evaluations
  - calibration information
  - field notes - (sampler issues, damage, contamination etc)

  However how this data is used in the validation process may differ among SLTs.

- Once the data is entered to AIRS there is additional QA reports that are run that can also help in the final validation of data.

Who is responsible for the activity (currently).

- SLTs

Pros and Cons of the activity as it's currently implemented:

Pros
- Some organizations have developed procedures for the consistent verification/validation of data
- Real time data reporting has helped to initiate verification/validation screening tools. Although these tools do not provide full validation of data, they do provide an early review of information.
- The $PM_{2.5}$ Data Validation Template helped provide some consistency in data verification validation among SLTs

Cons -
- There is no consistency in data verification/validation techniques among SLTs.
- Local site information could be very helpful in the validation process (events) but in many cases this information is not recorded and therefore not available.
- Resources in some SLTs not available for timely validation
- Present verification techniques taking too long, meaning corrective action is not taken as soon as possible.
- Due to the diverse use by SLTs information management systems, there is currently no easy way to develop automated validation techniques (at a headquarters level) in a cost effective manner.

Ways of improving the activity:

- Technology is available for more real time validation that could free up resources for other activities: This could start with:
  - Use of data logging, telemetry or "lease-lines" to get data into information management systems and validation systems more quickly.
  - Use of computer technology by the site operator to access data that has been reviewed at the "central office" in order to implement corrective actions in a more real time mode
  - Use of the new AIRS system to develop more data assessment/validation techniques that could then be consistently used by all SLTs.
- Continue the development of Validation Templates for the other criteria pollutants
- Development of QA/QC evaluation reports - The Workgroup suggested the generation of various validation/evaluation program and reports (on AIRS or standalone) to reduce the burden on data validation personnel and provide for quicker data certification.
- Certified/uncertified data flagging - Data qualifiers are not used for the majority of the SLAMS pollutants, meaning that SLT personnel wait for data to be validated before uploading to AIRS. Since many SLTs use data qualifiers on their local sites to inform data users that the real time data is not validated, maybe AIRS data could be initially uploaded as "unqualified" and on a quarterly basis, based on suggestion above, have this qualifier removed. This would allow OAQPS to develop generic data evaluation/validation reports (see below) on AIRS that could be used/or modified by the AIRS user community rather than having SLTs develop their own reports.

Who should be providing (responsible for) this activity?

- SLTs

Does this require changes to regulation or guidance?

- If data validation is tied to performance (DQOs) process (see figure) then some regulations changes may occur if QC criteria are changed or removed.
- Guidance in Redbook could be changed to reflect validation templates

Meeting Date: October 9, 2001

Agenda: Implementation– Internal Quality Control Activities

Attendees: Tom Parsons, Donovan Rafferty, Jerry Sheehan, Andy Johnson, Rayna Broadway, Anna Kelly, Mark Shanis, Mike Papp

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Quality System Element: **Implementation**

Quality System Activity: **Internal Quality Control Activities**

Activity Description:

Definition: the overall system of technical activities whose purpose is to measure and control the quality of a product or service so that it meets the needs of users. The aim is to provide quality that is satisfactory, adequate, dependable, and economical.

Actions covered under this description

- < See Redbook Measurement Quality Objective Forms (Appendix 3 in Redbook)
- < Zero/Span checks
- < Accuracy audits
- < Verification checks (flow rate, temp, pressure, time)
- < Calibrations
- < Recertifications (SRP program, primary standards and transfer standards) gases, other QC instruments
- < Precision checks (automated and collocated)
- < Detection limit tests
- < NPAP/State Audits (may also be included under performance evaluation)
- < Routine instrument maintenance

What is the function or use of this activity?

- < Ensure sampling, measurement equipment, or environmental monitoring conditions (shelters, labs) are operating within acceptable ranges to produce data of know and acceptable quality.

Is the activity important? (what does it get us)

- < Yes quality control activities provide data users with checks at enough frequency to maintain "control" over data quality at various phases (sampling, preparation, analysis) of the measurement process.

Is there a product? Who is the major user of the product or information

- In most case there is not a product other than routine data of acceptable quality. However, some of the major quality control samples are reported to AIRS and can be used to provide a measure of precision and bias for reporting agencies. Products such as control charts etc. can also help to document data of acceptable quality.

Is this a new activity? What activity does it replace or enhance?

- No it's not a new activity

Brief description of current activities

- Activities defined in Redbook

Who is responsible for the activity (currently)

- In most case State/local/Tribes are responsible for these activities

Pros and Cons of the activity as it's currently implemented:

Pros- The current QC check requirements and guidance do seem to provide an adequate evaluations of data quality

Cons
- Some organizations may feel "audited to death". There may be some redundancies with our various auditing activities such as NPAP, State and internal auditing functions
- Some QC checks have "lost there value" due to the improvements of monitoring technology.
- Reducing frequencies of some checks may have the potential for invalidating more data.

Ways of improving the activity:

- Automate measurement systems as much as possible. Providing state of the art measurement, data logging/data transfer and QC systems will provide coast savings in the long run and provide for QC at higher frequency at no additional cost.
- Automate zero/span - Some organizations may still be performing these manually and at less frequency than recommended.
- Through-the-probe zero/span/precision checks - have checks cover entire inlet/manifold systems
- Develop QC checks based on system performance. Some checks, due to better, more stable equipment may not need to be checked as frequently as required or suggested.
- Have vendors of new instruments be required to develop adequate SOPs as part of the reference and equivalency process (may need to be added to SOP form).

Who should be providing (responsible for) this activity?

- State/local/Tribal monitoring agencies will maintain responsibility for this activity.

Does is require changes to regulation or guidance?

- Unsure at present- a thorough review of QC requirements in CFR and guidance should be implemented.

Meeting Date: October 16, 2001

Agenda: Implementation– Record Keeping

Attendees: Tom Parsons, Andy Johnson, Don Gourley, Anna Kelly, Mike Papp

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Quality System Element: **Implementation**

Quality System Activity: **Record Keeping**

Activity Description:

Definition: a written, documented group of procedures describing required records, steps for producing them, storage conditions, retention period and circumstances for their destruction or other disposition.

Actions covered under this description

- Storage of pertinent ambient air monitoring program documents and records at State/local/Tribal organization, EPA Regions and Headquarters.

What is the function or use of this activity?

- To document or provide supporting documentation of the quality/validity of ambient air monitoring data and adherence to ambient air monitoring requirements.

Is the activity important? (what does it get us) - YES

- provides for a repository of pertinent program information.(current and historical)
- provides documentation of data validity

Is there a product? Who is the major user of the product or information

- Products are the records/documents. The user is the organization collecting the information and potentially organizations required to review the records during auditing activities or challenges to the data validity.

Is this a new activity? What activity does it replace or enhance?

- No, not a new activity.

Brief description of current activities.

Workgroup used Section 5 "Documentation and Records" of the Quality Assurance Handbook for Air Pollution Measurement Systems (Volume II Part 1) as a source of information on this subject. The table below, which is in the section, was reviewed to determine whether the categories and record types were appropriate and comprehensive.

Categories	**Record/Document Types**
Management and Organization	State Implementation Plan Reporting agency information Organizational structure of monitoring program Personnel qualifications and training Quality management plan Document control plan Support contracts
Site Information	Network description Site characterization file Site maps/pictures
Environmental Data Operations	QA Project Plans Standard operating procedures (SOPs) Field and laboratory notebooks Sample handling/custody records Inspection/maintenance records
Raw Data	Any original data (routine and QC)
Data Reporting	Air quality index report Annual SLAMS air quality information Data/summary reports Journal articles/papers/presentations
Data Management	Data algorithms Data management plans/flowcharts
Quality Assurance	Control charts Data quality assessments QA reports System audits Network reviews

A number of points were made during the discussions;

- < Some organizations have data archive requirements for much longer than the statute of limitations described in Section 5 of the Redbook (3 years).
- < It appeared that resources needed for records archive and storage were adequate.
- < The Breakout Group felt the table sufficiently covered the records and document types for the ambient air monitoring program. However certain records (i.e., record types in management and organization) may be the responsibility of management levels outside the monitoring organization.

- A monitoring organization may be responsible for data collection activities implemented by organizations outside of the immediate office (contractors or other local organizations) . We may need some additional guidance on what would need to be archived.

Who is responsible for the activity (currently)

- organizations responsible for ambient air data collection activities

Pros and Cons of the activity as it's currently implemented:

Pros-

Cons ! some organizations may not have a central filing capability. Therefore, individuals are filing and archiving information for which they are immediately responsible. During personnel turnover there is a possibility that this information gets discarded.

NOTE: This situation occurred with the CY2000 PM2.5 network where a significant amount of QC data disappeared when a site operator was removed from his/her position

- There may be discrepancies within organizations documentation (QMP/QAPPS/PPG) with regards to record keeping. Monitoring organization must ensure there is consistency among these various documents.

Ways of improving the activity:

- Centralize filing systems - it appeared that organizations are moving in this direction.
- Review Table 5-1 in Redbook- ensure agreement on record types.

Who should be providing (responsible for) this activity?

- Organization dependent.

Does it require changes to regulation or guidance?

- No change in regulation; may be modification to guidance

Other issues:

- Need to check on the defensibility of electronic data.

Meeting Date: September 13, 2001

Agenda: Assessment/Reporting -Site Characterization

Attendees: Mike Miguel, Michael Papp, Mark Shanis, Richard Heffern

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Quality System Element: **Assessment/Reporting**

Quality System Activity: **Site Characterization**

Activity Description

Definition: Applicable siting criteria for SLAMS, NAMS and PAMS are specified in 40 CFR Part 58 Appendix E. The on-site visit itself consists of the physical measurements and observations needed to determine compliance with the Appendix E requirements, such as height above ground level, distance from trees, paved or vegetative ground cover, etc

What is the function or use of this activity?

- The function of the site characterization is to ensure national uniformity of parameter specific air monitoring activities.

Is the activity important? (What does it get us)

- Yes, the activity is important and it allows one to determine if the network conforms to the regulations.

Is there a product? Who is the major user of the product or information?

- Yes, there is a product (report) and all levels of government use the information.

Is this a new activity? What activity does it replace or enhance?

- No, it enhances the overall consistency of air monitoring data.

Brief description of current activities.

- States/local conduct site evaluations of their air monitoring networks once a year. The Regions usually conduct site evaluations during a technical system audit and only conduct a percentage (5%) of a air monitoring network.

Who is responsible for the activity (currently).

- OAQPS, Regions and States are responsible for this activity.

Pros and Cons of the activity as it's currently implemented:

Pros:
- Aids the Regions and State/local to evaluate the air monitoring networks.
- Provides uniformity
- Some states have a Website for current site activities.

Cons
- No consistent documentation of site evaluations
- Most States do not have a website for current site activities.
- No consequences for not conducting site evaluations (No comparison between AIRS an hard copy in the files)

Ways of improving the activity:

- Conduct polls of the Regions and State/locals on who is conducting site evaluations.
- Setting minimal levels and tracking - review the requirements for the frequency of such characterization and recommend a change (if necessary).
- Ensure better tracking of this information to ensure they are being performed. AIRS has an area that can be used for this tracking activity.
- Ensure updates made in AIRS - Information from inspections (monitors or sampling equipment added to site, Lat/Long changes) that reflect a needed change in the site record in AIRS are not always getting revised. There needs to be some method of ensuring information found during site characterization gets corrected in AIRS in a timely manner.
- Development and use of site characterization form- A site characterization form and possibly software could be developed and distributed to provide some consistency in performing site characterizations.
- Site characterization training- It was suggested that a training module be developed for the performance of site characterizations.
- Speed up approvals for discontinuing sites- SLTs submit paperwork for discontinuing sites that do not get approved for a considerable length of time. OAQPS needs to review this process

Who should be providing (responsible for) this activity.

- The Regions and the States should be responsible for this activity.

Does this require changes to the regulation or guidance?

- No

Meeting Date: September 26, 2001

Agenda: Assessment/Reporting - Performance Evaluations

Attendees: Danny France, Matt Plate, Mark Shanis, Mike Miguel, Richard Heffern, Rayna Broadway, Vic Guide, Rachael Townsend, Scott Hamilton

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Quality System Element: **Assessment/Reporting**

Quality System Activity: **Performance Evaluation** (NPAP, PEP, Ozone Verification)

Definition: a type of audit in which the quantitative data generated in a measurement system are obtained independently and compared with routinely obtained data to evaluate the proficiency of an analyst or laboratory.

What is the function or use of this activity?

- To ensure the quality of data collect and resolve any significant quality assurance problems.

Is the activity important? (What does it get us)

- The activity is important. It allows for the intercomparability of data sets and identification of problem areas.

Is there a product? Who is the major user of the product or information.

- Uniform data on a national level. All levels of the government/tribes and industry are major users of this information.

Is this a new activity? What activity does it replace or enhance?

- No. The performance evaluation program enhances the overall quality system on the nation's air monitoring program.

Brief description of current activities.

- State/locals and PSD networks participate in the NPAP and PEP. Most tribal agencies do not participate in the programs.

Who is responsible for the activity (currently) ?

- OAQPS, Regions and States are responsible for the activity.

Pros and Cons of the activity as it's currently implemented.

Pros:
- It enhances the overall consistency of air monitoring data.
- Some states like the program as it is.

Cons:
- Very little return for the VOCs and Carbonyl for the PAMS.
- Some states have such small air monitoring programs it is impossible to have adequate separation QA and monitoring staff. In this case, independence is not achieved.
- To much duplication in the program.
- Need more flexibility in the program.
- Regulatory guidance in certifying ozone transfer standards is 20 years old.

Ways of improving the activity:

- PAMS NPAP should be conducted in the January to March time frame so that potential problems can be rectified prior to the ozone season.
- Less compounds could be included in the PAMS NPAP audits. Participants would prefer if higher quality standards (NIST) are utilized with less compounds.
- It was suggested that ambient air comparisons be used to compare between lab results. This is already being done at some Regions.
- Headquarters should certify auditors for parameters. This is being done for PM2.5.
- Eliminate duplication in the NPAP program. EPA could certify States that do have a PE program in place, conduct round robin with labs.
- Combining NPAP and PEP Program- Revise NPAP to a through-the-probe audit approach. STAG funding mechanism of the current $PM_{2.5}$ PEP could be enhanced to include NPAP.
- Revise requirements for industry to contribute payments to NPAP- In the past, the NPAP, which was required under the PSD requirements, provided audits to industry for free. It was suggested that a mechanism for industry payment could be added to the requirement
- The current regulation require transfer standards to undergo a 6-certification at the beginning of each ozone season (provided the previous 6-days certification lapsed) and then a 1-day recertification at the end of 90 days. This poses a problem in some areas which have to ship ozone standards. The current frequency may be overkill. The group commented that this would depend on the situation. For example, if a reporting organization was experiencing discreprencies or other QA/QC problems, the frequency may need to be increased so that the problem could be resolved. Conversely, if a reporting organization was running smoothly with audits, calibrations and span checks showing expected results, then this frequency may be too much. The group concluded that the 90-day frequency seems to be appropriate but is subjective.
- Update guidance and practicability of the SRP. The SRP guidance has not been revised for a considerable length of time. Due to the stability of new ozone instruments, and jargon (definitions of primary and transfer standards etc.) that needs be revised, it was felt that the SRP program guidance needed updating.
- PM2.5 PEP comments: Alaska commented that the PEP auditor need to space out audits throughout the year. It was suggested that the quarterly audits may be too many. The

frequency of could be determined by the success (or failure) of the previous audit.

Who should be providing(responsible for) this activity?

- OAQPS , Regions and the States should be responsible for this activity.

Does the activity require changes to regulation or guidance?

- Current regulatory guidance used in certifying ozone transfer standards may need to change.

Meeting Date: October 10, 2001

Agenda: Assessment/Reporting - PSD networks participation in NPAP

Attendees: Danny France, Matt Plate, Mark Shanis, Michael Papp, Mike Miguel
Scott Hamilton, Richard Heffern, Rayna Broadway

Quality System Element: **Assessment/Reporting**

Quality System Activity: **PSD networks participation in NPAP**

What is the function or use of this activity?

- The function of the PSD networks participation in the National Performance Audit Program is to ensure that the ambient air data collected is of a known quality.

Is the activity important? (What does it get us)

- Yes, the activity is important and it gives us a picture of an industry's quality system.

Is there a product? Who is the major user of the product or information?

- Yes, there is a product (report) and OAQPS, Regions and the States will use the information.

Is this a new activity? What activity does it replace or enhance?

- No, this is not a new activity and the NPAP will provide a assessment of an industry's air monitoring network.

Brief description of current activities.

- Most States require that the industries participate in the NPAP.
- Some PSD networks ambient air data is submitted to AIRS.

Who is responsible for the activity (currently).

- OAQPS , Regions and States are responsible for this activity.

Pros and Cons of the activity as it's currently implemented:

Pros:
- Aids State/local to evaluate the industries air monitoring networks.
- Industries are requesting to participate in the NPAP.

Cons
- No mechanism in place to receive money from industry for their participation in the NPAP.
- Funds being cut from the NPAP, therefore industry participation is lessen.

Ways of improving the activity:

- There should be a mechanism in place to allow industry to pay for their participation in the NPAP.

Who should be providing (responsible for) this activity.

- OAQPS , Regions and the States should be responsible for this activity.

Does this require changes to the regulation or guidance?

- Yes.

Meeting Date: October 10, 2001

Agenda: Assessment/Reporting - Technical Systems Audits

Attendees: Danny France, Matt Plate, Mark Shanis, Michael Papp, Mike Miguel, Scott Hamilton, Richard Heffern, Rayna Broadway

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Quality System Element: **Assessment/Reporting**

Quality System Activity: **Technical Systems Audits**

Activity Description:

Definition: a thorough, systematic on-site, qualitative review of facilities, equipment, personnel, training, procedures, record keeping, data validation, data management, and reporting aspects of a total measurement system

What is the function or use of this activity?

- The function of the Technical System Audits (TSA) are to promote national uniformity in the evaluation of state and local agency monitoring programs and agencies performance.

Is the activity important? (What does it get us)

- Yes, the activity is important and it gives us a picture of an agencies overall performance.

Is there a product? Who is the major user of the product or information?

- Yes, there is a product and all levels of government use the TSA report.

Is this a new activity? What activity does it replace or enhance?

- No, this is not a new activity and the TSA will promote the uniformity of the air monitoring program.

Brief description of current activities.

- Most Regions and some states conduct TSA's. There may be a need to conduct TSA's of Tribal organizations.

Who is responsible for the activity (currently).

- The Regions and States are responsible for this activity.

Pros and Cons of the activity as it's currently implemented:

Pros:! Promote uniformity in the evaluation of the State/local agencies.
! TSA's can identify problem areas.

Cons ! Some Regions and States are not conducting TSAs

Ways of improving the activity:

- < There should be a minimum level of tracking TSAs. (Maybe in the new AIRS)
- < Develop TSA Teams (Regions, State/local)
- < Conduct TSA of Tribal air monitoring programs.
- < Collect the various audit forms being used in the nation in one place and make available to the air monitoring community.

Who should be providing (responsible for) this activity.

- < The Regions and States should be responsible for this activity.

Does this require changes to the regulation or guidance?

- < No.

Meeting Date: October 3, 2001

Agenda: Assessment/Reporting - Data Quality Assessment

Attendees: Danny France, Matt Plate, Shelly Eberly, Mike Miguel, Don Gourley, Rayna Broadway, Vic Guide, Kuenja Chung, Richard Heffern, Michael Papp, Regina Charles

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Quality System Element: **Assessment/Reporting**

Quality System Activity: **Data Quality Assessment**

Definition: the statistical evaluation of a data set to establish the extent to which it meets user-defined application requirements (i.e., DQOs).

What is the function or use of this activity?

- To ensure the quality of data collected can be used to make a decision with a desired confidence.

Is the activity important? (What does it get us)

- The activity is important. It gives us a statistical evaluation of data.

Is there a product? Who is the major user of the product or information.

- Yes, there is a product and OAQPS and the regions are the major users.

Is this a new activity? What activity does it replace or enhance?

- Yes, data quality assessments enhances the overall quality system on the nation's air monitoring program

Brief description of current activities.

- All levels of government perform data quality assessments, but not from a statistical standpoint.

Who is responsible for the activity (currently) ?

- OAQPS and Regions are responsible for the activity.

Pros and Cons of the activity as it's currently implemented.

Pros:
- Summary on information for criteria pollutants available in AIRS.
- Good DQOs will help develop good DQAs.

Cons:
- Not many DQAs performed from a statistical standpoint.

Ways of improving the activity:

- Provide real time feedback.
- Provide statistical assessments (maybe available in new AIRS).
- Development of DQA tools - Similar to the $PM_{2.5}$ DQO software that is being modified as a DQA tool, as DQO development on the other criteria pollutants move forward (recommendation in another section above) DQA tools will also be made available. It is anticipated that these tools would be integrated with AIRS

Who should be providing(responsible for) this activity?

- OAQPS responsibility for DQAs - The Workgroup concluded that OAQPS should be responsible for the development of DQAs for all federally required data at the reporting organization level. Assessments at the site specific level or for objectives other than federal (i.e., non-trends speciation sites) would be the responsibility of the SLTs and be described in their QAPP.

Does the activity require changes to regulation or guidance?

- Yes

Meeting Date: October 3, 2001

Agenda: Assessment/Reporting - QA Reports

Attendees: Danny France, Matt Plate, Shelly Eberly, Mike Miguel, Rayna Broadway, Vic Guide, Kuenja Chung, Richard Heffern, Michael Papp, John Gourley, Regina Charles

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Quality System Element: **Assessment/Reporting**

Quality System Activity: **QA Reports**

Definition: Documents describing a quality system for a particular project or program for a particular period of time and the resultant data quality. The term is used as a catch all for various types of reports including reports on results of performance evaluations and systems audits, results of periodic data quality assessments, and significant quality assurance problems and recommended solutions

What is the function or use of this activity?

- The function of the QA Reports are to provide an overall assessment of the air monitoring program to management.

Is the activity important? (What does it get us)

- Yes, the activity is important. QA reports give us the ability to identify problem areas in our air monitoring system.

Is there a product? Who is the major user of the product or information?

- Yes, there is a product and all levels of government use the QA reports.

Is this a new activity? What activity does it replace or enhance?

- No, this not a new activity and it will enhance the quality of air monitoring data collected in the nation.

Brief description of current activities.

- Most States/locals, Regions and OAQPS use QA reports.

Who is responsible for the activity (currently)

- OAQPS, Regions and States/locals are responsible for the activity.

Pros and Cons of the activity as it's currently implemented:

Pros:
- QA reports used by all levels of government.
- QA reports improves the quality system of an agency.

Cons:
- PSD QA reports should be assess.

Ways of improving the activity:

- Need to assess the system audits of contractors (especially PSD).

Who should be providing (responsible for) this activity?

- Headquarters, Regions, State/locals/Tribal should be responsible for this activity.

Does this require changes to the regulation or guidance?

- Yes

Meeting Date: October 3, 2001

Agenda: Assessment/Reporting - P&A Reports

Attendees: Danny France, Matt Plate, Shelly Eberly, Mike Miguel, Rayna Broadway, Vic Guide, Kuenja Chung, Richard Heffern, Michael Papp, John Gourley, Regina Charles

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Quality System Element: **Assessment/Reporting**

Quality System Activity: **P&A Reports**

Definition: Reports describing the achievement of the precision and accuracy requirements for the Ambient Air Quality Monitoring Program.

What is the function or use of this activity?

- The function of the P&A Reports are to provide an overall assessment of air monitoring data.

Is the activity important? (What does it get us)

- Yes, the activity is important. P&A reports give us the ability to identify problem areas in our air monitoring system.

Is there a product? Who is the major user of the product or information?

- Yes, there is a product and all levels of government use the P&A report.

Is this a new activity? What activity does it replace or enhance?

- No, this not a new activity and it will enhance the quality of air monitoring data collected in the nation.

Brief description of current activities.

- Most States/locals, Regions and OAQPS use P&A reports.
- Tribes need to use precision and accuracy reports.

Who is responsible for the activity (currently)

- OAQPS and the Regions are responsible for the activity.

Pros and Cons of the activity as it's currently implemented:

Pros:
- Summary information for precision and accuracy data is available in AIRS
- P&A Reports used by all levels of government.

Cons
- PSD networks should have P&A Reports.
- P&A probability limits should be reviewed.

Ways of improving the activity:

- Correct problems of uploading precision data in AIRS.
- Burden reduction of precision and accuracy checks should be addressed in the regulations.
- Improve cooperation from States/locals/tribes in getting precision data into AIRS.
- Include frequency of audits in the QAPP.

Who should be providing (responsible for) this activity?

- Headquarters, Region, State/locals should be responsible for this activity.

Does this require changes to the regulation or guidance?

- Yes

Meeting Date: October 10, 2001

Agenda: Assessment/Reporting - Quality System Audits

Attendees: Danny France, Matt Plate, Mark Shanis, Michael Papp, Mike Miguel, Scott Hamilton, Richard Heffern, Rayna Broadway

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Quality System Element: **Assessment/Reporting**

Quality System Activity: **Quality System Audits**

Definition: the qualitative assessment of a data collection operation and/or organization(s) to establish whether the prevailing quality management structure, practices, and procedures are adequate for ensuring that the type and quality of data needed and expected are obtained

What is the function or use of this activity?

- The function of the Quality System Audit (QSA) is a process of qualitatively assessing the effectiveness of management practices in applying QA/QC to environmental data operations.

Is the activity important? (What does it get us)

- Yes, the activity is important and it gives us a picture of an agency quality system.

Is there a product? Who is the major user of the product or information?

- Yes, there is a product (report) and OAQPS, Regions and the States will use the information.

Is this a new activity? What activity does it replace or enhance?

- Yes, this is a new activity and the QAS will provide a assessment of an agency's Quality Management Plan.

Brief description of current activities.

- OAQPS and some Regions have conducted QSAs.

Who is responsible for the activity (currently).

- OAQPS, Regions and States are responsible for this activity.

Pros and Cons of the activity as it's currently implemented:

Pros:! Aids management to evaluate the entire agency's program concerning a quality system.

Cons ! No joint audit form (TSA and QSA audit form).

Ways of improving the activity:

- < There should be development of an audit form to include TSA and QSA .

Who should be providing (responsible for) this activity.

- < OAQPS , Regions and the States should be responsible for this activity.

Does this require changes to the regulation or guidance?

- < No.

Attachment 2
QA Strategy Action Item/Recommendations Voting Results

As a result of the QA Workshop (Oct 23-25, 2001) the QA Workgroup produced a large lists of recommendations and action items for improvements to the ambient air monitoring quality system. The Workgroup compiled a list of these suggestions and voted on their priority (high-1, medium - 2, low -3), whether the improvement could be made with little or no additional resources (Y or N) and the time frame on when the recommendation should be implemented (within 1 year -1, within 2 years-2, or 3 or greater years -3). Attachment 2 provides the listing of these recommendations in order of priority (first), and time frame (second). QA Workgroup members voting on this list included State, local and Tribal monitoring agencies (12), EPA Regions (4) and EPA OAQPS (2)

QA Strategy Action Item/Recommendations Voting Results		
Priority	**Time**	**Recommendation/Action Item**
1.17	1.69	State and locals need to have a full time person for QA for the air monitoring programs
1.22	1.78	OAQPS needs to develop DQOs for the NAAQS. In addition, there should be a project to evaluate converting the DQOs for PM2.5 to include performance-based standards.
1.24	1.47	Have vendors of new instruments be required to develop adequate SOPs as part of the reference and equivalency process (may need to be added to SOP form).
1.28	1.50	National air monitoring QA conference (annually) to help consistency (fund through 105, like AIRS conf.)
1.31	2.00	Use of automated zero-span, precision checks to validate data
1.35	1.18	Correct problems of uploading precision data in AIRS.
1.39	1.81	Need DQOs to do DQA - Work on priority DQOs
1.39	1.85	Getting DQO tool working with AIRS
1.41	1.71	Review grant process to tie QA costs to monitoring costs
1.41	2.03	Continue the development of Validation Templates for the other criteria pollutants
1.44	1.90	Development of critical review criteria in AIRS
1.47	1.76	Get more state and locals in on which documents are more important to them, in order to prioritize revisions
1.47	1.80	Provide real time feedback.
1.47	1.97	Redbook needs updating -- have calls with states and regions
1.47	2.12	Training for TSAs, DQAs, and data validation
1.50	1.44	QA forum for continued support and exchange of information.
1.50	1.47	PAMS NPAP should be conducted in the January to March time frame so that potential problems can be rectified prior to the ozone season.
1.53	1.74	Ensure grant funding is available for QA related training
1.53	2.15	Use of the new AIRS system to develop more data assessment/validation techniques that could then be consistently used by all SLTs.
1.56	1.33	Define or clarify attributes or responsibilities of QA person or manager
1.56	1.72	Clear discrimination between guidance and regulation
1.56	1.94	Training for managers so they understand components/need for QA
1.56	2.47	Automate measurement systems as much as possible. Providing state of the art measurement, data logging/data transfer and QC systems will provide coast savings in the long run and provide for QC at higher frequency at no additional cost.
1.59	1.63	Recommendations for NPAP program: eliminate duplication in the program, EPA could certify states that do have QA in place, conduct round robin with labs
1.59	1.65	Need to work out details of graded approach.
1.59	1.79	Ensure AIRS summarizes data as DQOs indicate
1.59	1.81	Review each methods and QA for "musts" and "shalls". Identify "musts" in regulation without describing frequency or acceptability.
1.59	2.03	Provide statistical assessments (maybe available in new AIRS)
1.59	2.15	Combine all guidance into one document (Redbook)
1.61	1.53	Improve cooperation from States/locals/tribes in getting precision data into AIRS.
1.63	2.38	Use of data logging, telemetry or "lease-lines" to get data into information management systems and validation systems more quickly.
1.64	1.69	Audit PAMS and get results out before ozone season.
1.65	1.74	Develop audit teams from SLT and Regions in order to share experience/knowledge
1.65	1.82	Update SRP guidance and make practical
1.65	1.91	Develop a template QAPP (fill in the blanks) -- generic for any air program, not just criteria pollutants – needs to handle graded approach
1.66	2.09	Need a mechanism to ensure corrective action from evaluation and updates in AIRS
1.67	2.00	Development of auditing QA software tool
1.67	2.14	Incorporate spatial representativeness (or lack thereof) into DQOs
1.68	2.06	Streamlining audit programs (audit auditors?), SRP & NPAP
1.69	1.85	NPEP funding through STAG is appropriate
1.69	1.94	Develop QC checks based on system performance. Some checks, due to better, more stable equipment may not need to be checked as frequently as required or suggested.
1.72	1.97	Burden reduction of precision and accuracy checks should be addressed in the regulations.

QA Strategy Action Item/Recommendations Voting Results		
Priority	**Time**	**Recommendation/Action Item**
1.75	1.60	There should be a mechanism in place to allow industry to pay for their participation in the NPAP (PSD)
1.76	1.29	Electronic record keeping -- check with OEI to see if electronic files are acceptable (legally defensible?)
1.76	1.76	Guidance to EPA regions on the need for consistency in the review of QAPPs
1.76	1.85	Develop training on how to conduct TSA. Minimal steps to take during TSA. Include in Redbook
1.76	2.00	Certification/accreditation program - hierarchical approach -- OAQPS-Regions-State/local
1.76	2.09	Conduct TSA of Tribal air monitoring programs.
1.76	2.21	Provide statistical assessments (maybe available in new AIRS)
1.76	2.34	Through-the-probe zero/span/precision checks - have checks cover entire inlet/manifold systems
1.78	1.67	Expand AMTIC Web links to training
1.81	2.23	Use of computer technology by the site operator to access data that has been reviewed at the "central office" in order to implement corrective actions in a more real time mode
1.88	1.71	Guidance for QAPPs should clearly state that QAPPs that are for projects covered by a QMP do not need to duplicate information in the QMP or applicable SOPs.
1.88	1.91	Define needs for QMPs for all agencies.
1.88	2.19	Review and develop "minimal" TSA form in Redbook
1.89	1.97	Contractual mechanisms to provide support, such as DQO/DQA statistical support
1.90	1.61	Less compounds could be included in the PAMS NPAP audits. Participants would prefer if higher quality standards (NIST) are utilized with less compounds.
1.93	2.07	Develop documentation for states that opt out of NPEP
1.93	2.25	Revise EPA QA/R-2 with the substantive changes discussed in Workshop. Will not revise R2; will create ambient air specific R2.
1.94	1.78	Definition/interpretation of primary and transfer standards
1.94	2.06	Can flagging help get data in sooner? Flag data in AIRS as "unvalidated" for use more real time, then pull "unvalidated" flag off quarterly or yearly
1.97	2.14	Guidance on timeliness and consistency in performing site evaluations
2.00	1.88	Collect the various audit forms being used in the nation in one place and make available to the air monitoring community.
2.00	2.19	Set minimal level of conducting site evaluations (Redbook)
2.00	2.26	Develop the guidance for small organizations and projects, such as those who can collapse the QMP and QAPP
2.06	1.63	Look to see if there is a requirement for a central filing systems -- QA order 5360.1???
2.06	2.03	Recommendations/guidance for central filing system (Redbook) including what should be in those filing systems
2.07	1.90	Perform survey to determine "acceptable" PE programs in order to avoid redundancy.
2.11	2.03	Place some important training in regulation
2.11	2.06	What is reporting organization? Does this need to be re-defined or should the definition be strictly adhered
2.11	2.33	Develop web- based training courses
2.11	2.47	OAQPS oversight is very helpful -- site visits annually for some (maybe with MSR)
2.12	2.21	Develop combo TSA, QSA audit form
2.12	2.24	The graded approach needs to be addressed in the CFR, including specific criteria for different levels of QAPPs with examples
2.12	2.31	Increase consistency between EPA Regional offices on how they review QMPs.
2.13	1.57	Review Table 5-1 in Redbook- ensure agreement on record types
2.18	1.82	Conduct polls of the Regions and State/locals on who is conducting site evaluations
2.19	2.16	There should be a minimum level of tracking TSAs. (Maybe in the new AIRS)
2.21	2.32	Tools to help w/DQAs, beginning with annual/3-year reports.
2.27	1.87	Revise CFR to quarterly certifications
2.29	2.21	APDLN - more hubs, e.g., Alaska, Guam
2.61	2.33	Combine 58 Appendix A and B